

## **Market Operations – Post Dispatch**

### **1 Descriptions of Functions – Post Dispatch Market Operations**

*All prior work (intellectual property of the company or individual) or proprietary (non-publicly available) work should be so noted.*

#### **1.1 Function Name**

*Name of Function*

Post Dispatch Market Operations across 3 Western Regional Transmission Organizations (RTOs)

#### **1.2 Function ID**

*IECSA identification number of the function*

M-6

#### **1.3 Brief Description**

*Describe briefly the scope, objectives, and rationale of the Function.*

As the electricity industry is deregulated, and as FERC defines more clearly what the market operation tariffs will encompass, three possible Regional Transmission Organizations (RTOs) in the Western Interconnection are developing seamless interfaces for Market Participants to submit energy schedules and ancillary service bids across these 3 RTOs. The 3 RTOs are California ISO (existing ISO handling the electricity market in California), RTO West (potential RTO of many northwestern utilities), and WestConnect (potential RTO of many southwestern utilities). These 3 RTOs are developing the requirements for the Western RTO functions. The descriptions of the functions below may or may not represent the final market rules and market operations, because these have not been finalized yet.

## 1.4 Narrative

*A complete narrative of the Function from a Domain Expert's point of view, describing what occurs when, why, how, and under what conditions. This will be a separate document, but will act as the basis for identifying the Steps in Section 2.*

The following is a list of Western RTO functions related to Post Dispatch Market Operations.

Only the listed functions with asterisks are represented in the diagrams and/or step-by-step descriptions in section 2.

1. Post-Dispatch
  - a. Metering Data Collection \*
    - Register meters
    - Process meter revenue data
  - b. Transmission and Distribution Schedule Checkout \*
  - c. Financial Settlements \*
    - LMP Calculation
    - Losses calculation
    - Reconcile ISO market
    - Reconcile real-time market
    - Resolve disputes
  - d. Accounting and Billing \*
    - Create budget and financial forecast
    - Manage accounts payable
    - Manage accounts receivable
    - Purchasing
  - e. Market Monitoring and Auditing \*
    - Develop monitoring criteria
    - Perform market assessment
    - Investigate market abuse

## 1.5 Actor (Stakeholder) Roles

Describe all the people (their job), systems, databases, organizations, and devices involved in or affected by the Function (e.g. operators, system administrators, technicians, end users, service personnel, executives, SCADA system, real-time database, RTO, RTU, IED, power system). Typically, these actors are logically grouped by organization or functional boundaries or just for collaboration purpose of this use case. We need to identify these groupings and their relevant roles and understand the constituency. The same actor could play different roles in different Functions, but only one role in one Function. If the same actor (e.g. the same person) does play multiple roles in one Function, list these different actor-roles as separate rows.

<i>Grouping (Community)</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Area & Resource Operation Centers	Corporation	Operation Centers which perform AGC and other activities on utility facilities within a specific control area
Auditor	Person	Audits logs and records
Database Administrator	Person	Maintains databases
DisCos	Corporation	Distribution company
Distribution Power System	System	Distribution power system
Eligible Customer Metered Entity	Corporation	A company that has a special relationship with the RTO with respect to market participation
Eligible Customers	Person	Person responsible and authorized to act for the Eligible Customer Metered Entity
GenCos	Corporation	Generation company

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Interval Meters	Device	Meters that can identify energy usage for different time intervals during the day and week
LGR Owners	Person	Local Generation Resource owner, who manages their Local Generation Resources, which may be larger power plants, distributed energy resources, or load management
Load Profiles	Database	Database of load profiles for different types of customers, based on time of day, day of week, and season
Market Participant	Person	Any participant in the electricity marketplace
Metered Entities	Corporation	Any customer or group of customers that are metered
National Weather Service	Corporation	Provides weather information
NERC	Corporation	National Electric Reliability Council which handles etagging for market operations
Other 2 RTOs	Corporation	For each RTO, this actor represents the other two RTOs in the Western Interconnection
RetailCos	Corporation	Retail companies
RTO Operator	Person	Operator of the power system for the RTO
RTO Programmer /Engineer	Person	Programmer and/or engineer that works for an RTO

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
RTO Scheduler	Person	Person who handles the energy scheduling and ancillary services for an RTO
SC-FTR Owner	Person	Scheduling Coordinator who is also an owner of Firm Transmission Capacity (FTR)
Scheduling Coordinators	Person	Authorized to submit energy schedules and ancillary services bids to the RTO
Settlement Administrator	Person	Person handling the settlement of the financial transactions that took place during market operations
Settlement Data Mgmt Agent	Corporation	Company that provides individual and amalgamated metering data into the settlements process
Standard Customers Meters	Device	Common meters, that are not interval meters
Tag Authority	Corporation	Entity that is responsible for managing e-tagging
Time Line Manager Function	Timer	Timer based on periodicity and/or specific time of day, and/or specific day of week. The timer triggers specific activities
Transmission Owner	Corporation	Owner of transmission circuits
Transmission Power System	Power System	Power system that provides transmission of energy on transmission circuits
WSCC	Corporation/Regulator	Western Systems Coordinating Council

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Power System Model	Database	Database with model of the power system connectivity and the characteristics of the power system elements
Other RTO Power System Model	Database	Databases with power system models belonging to the other RTOs
Transmission Outage Schedules	Database	Database of schedules of planned outages of transmission equipment for maintenance and/or construction
LGR Generation Maintenance Schedules	Database	Databases of maintenance schedules for local generation resources
Energy Schedules	Database	Database of schedules of energy sources matched with loads
Ancillary Services Schedules	Database	Database of schedules of available ancillary services
Transmission Rights Ownership Database	Database	Database linking owners to transmission rights
FTR Requirements Matrix	Database	Matrix of firm transmission rights requirements to available FTRs
Transmission System Characteristics Database	Database	Database of transmission system characteristics
Existing Transmission Contracts	Database	Database of existing transmission rights contracts
Operating Plan	Database	Database containing the operating plan that will actually be implemented to run the power system

<i>Grouping (Community)</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Balancing Energy Stack	Database	Database containing the ancillary services that are available for use, organized by price, for balancing the power system generation against load

Replicate this table for each logic group.

## 1.6 Information Exchanged

Describe any information exchanged in this template.

<i>Information Object Name</i>	<i>Information Object Description</i>

## 1.7 Activities/Services

Describe or list the activities and services involved in this Function (in the context of this Function). An activity or service can be provided by a computer system, a set of applications, or manual procedures. These activities/services should be described at an appropriate level, with the understanding that sub-activities and services should be described if they are important for operational issues, automation needs, and implementation reasons. Other sub-activities/services could be left for later analysis.

<i>Activity/Service Name</i>	<i>Activities/Services Provided</i>
Maintenance Outage Function	Analyzes maintenance outages

<i>Activity/Service Name</i>	<i>Activities/Services Provided</i>
7-Day Load Forecast Function	Determines the long term load forecast
Congestion Management Function	Determines if congestion could occur
Operations Transmission Capacity	Determines the Operations Transmission Capacity, based on energy schedules
Western Market Interface Web Server	Manages the interface between the RTOs and the Market Participants
Data Acquisition and Control Subsystem	Monitors and controls field devices
Available FTR	Manages FTRs
FTR Market Clearing Price Auction Function	Determines market clearing price of FTRs based on energy schedules
Energy Schedules Analysis Function	Analyzes the energy schedules
Ancillary Services Procurement Analysis	Analyzes the needs for ancillary services
Tag Approval Service	Approves electronic tags

## **1.8 Contracts/Regulations**

*Identify any overall (human-initiated) contracts, regulations, policies, financial considerations, engineering constraints, pollution constraints, and other environmental quality issues that affect the design and requirements of the Function.*

<i>Contract/Regulation</i>	<i>Impact of Contract/Regulation on Function</i>
Market Tariff	Basis for all actions

<i>Policy</i>	<i>From Actor</i>	<i>May</i>	<i>Shall Not</i>	<i>Shall</i>	<i>Description (verb)</i>	<i>To Actor</i>

<i>Constraint</i>	<i>Type</i>	<i>Description</i>	<i>Applies to</i>

## 2 Step by Step Analysis of Function

*Describe steps that implement the function. If there is more than one set of steps that are relevant, make a copy of the following section grouping (Preconditions and Assumptions, Steps normal sequence, and Steps alternate or exceptional sequence, Post conditions)*

### 2.1 Metering Data Collection (MDC)

#### 2.1.1 MDC – Preconditions and Assumptions

*Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities*

*Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place*

*Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.*

<i>Actor/System/Information/Contract</i>	<i>Preconditions or Assumptions</i>
All	Market operations are functioning according to the Market Tariff

## 2.1.2 MDC – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
1a	Every metering cycle	Interval Meters	Provide interval meter readings	Provide interval meter readings	Interval Meters	Eligible Customer Metered Entity	Meter readings		Customer / ESP
1b		Interval Meters	Provide interval meter readings	Provide interval meter readings	Interval Meters	Metered Entities	Meter readings		Customer / ESP
2a		Metered Entities	Provide metering data	Provide metering data	Metered Entities	Settlement Data Mgmt Agent	Meter readings		Customer / ESP
2b		Standard Customers Meters	Provide monthly meter readings	Provide monthly meter readings	Standard Customers Meters	Settlement Data Mgmt Agent	Meter readings		Customer / ESP
2c		Eligible Customer Metered Entity	Provide interval metered data	Provide interval metered data	Eligible Customer Metered Entity	Settlement Data Mgmt Agent	Meter readings		Customer / ESP
2d		Load Profiles	Apply load profiles to non-interval meter readings	Apply load profiles to non-interval meter readings	Load Profiles	Settlement Data Mgmt Agent	Load data		Customer / ESP
3		Metered Entities	Provide metering data	Provide metering data	Metered Entities	Transmission Owner	Meter readings		Control Centers / ESPs

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
4a		Transmission Owner	Provide validated metering data in a standard meter format	Provide validated metering data in a standard meter format	Transmission Owner	RTO Meter Data Management System	Meter readings		RTOs / Market Participants
4b		Settlement Data Mgmt Agent	Provide validated and aggregated metering data in a standard meter format	Provide validated and aggregated metering data in a standard meter format	Settlement Data Mgmt Agent	RTO Meter Data Management System	Meter readings		RTOs / Market Participants

### 2.1.3 MDC – Steps – Alternative / Exception Sequences

*Describe any alternative or exception sequences that may be required that deviate from the normal course of activities. Note instructions are found in previous table.*

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments

### 2.1.4 MDC – Post-conditions and Significant Results

*Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.*

*Describe any significant results from the Function*

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>

### 2.1.5 MDC – Architectural Issues in Interactions

*Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number..*

### 2.1.6 MDC – Current Implementation Status

*Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above  
Identify the key existing products, standards and technologies*

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

#### *Current Implementations:*

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Future, no systems, no interactions	

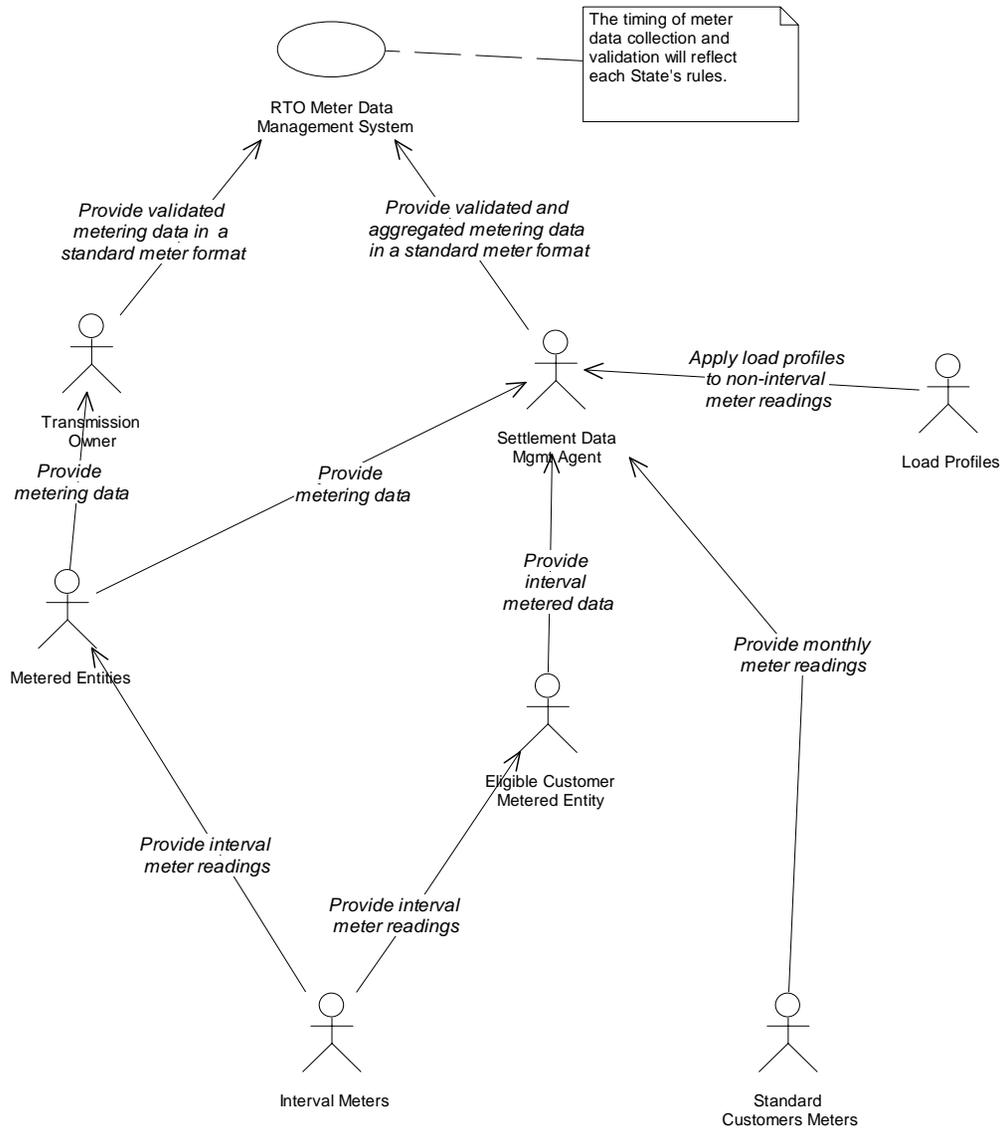
<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

### **2.1.7 MDC – Diagram**

*For clarification, draw (by hand, by Power Point, by UML diagram) the interactions, identifying the Steps where possible.*

Metering Data Collection Processes



## 2.2 Transmission and Ancillary Services Schedule Checkout (TASC)

### 2.2.1 TASC – Preconditions and Assumptions

*Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities*

*Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place*

*Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.*

<i>Actor/System/Information/Contract</i>	<i>Preconditions or Assumptions</i>

## 2.2.2 TASC – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
(1a)	Cycle for checking out actual vs. planned energy schedules	Operating Plan	Provide actual schedule	Provide actual schedule	Operating Plan	Settlement System	Actual energy schedule		RTOs / Market Participants
(1b)		Other 2 RTOs	Provide actual schedules from other RTOs	Provide actual schedules from other RTOs	Other 2 RTOs	Settlement System	Actual energy schedule		RTOs / Market Participants
(2)		Settlement Administrator	On 1st day after Trading Day, initiate preliminary schedule checkout	On 1st day after Trading Day, initiate preliminary schedule checkout	Settlement Administrator	Settlement System	Actual energy schedule vs. planned energy schedules		User Interface
(3)		Settlement System	Provide preliminary schedule checkout	Provide preliminary schedule checkout	Settlement System	Scheduling Coordinators	Actual energy schedule vs. planned energy schedules		User Interface

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
(4)		Scheduling Coordinators	By 4th day after Trading Day, file schedule disputes	By 4th day after Trading Day, file schedule disputes	Scheduling Coordinators	Settlement System	Disputed energy schedules		User Interface
(5)		Settlement System	Review and resolve disputes	Review and resolve disputes	Settlement System	Settlement Administrator	Disputes		User Interface
(6)		Settlement Administrator	By 5th day after Trading Day, initiate final schedule checkout	By 5th day after Trading Day, initiate final schedule checkout	Settlement Administrator	Settlement System	Final resolutions on energy schedule		User Interface
(7a)		Settlement System	Report validated schedules to NERC	Report validated schedules to NERC	Settlement System	NERC	Final validated energy schedules		Inter-Corporation
(7b)		Settlement System	Report validated schedules to other RTOs	Report validated schedules to other RTOs	Settlement System	Other RTOs	Final validated energy schedules		RTOs / Market Participants

### 2.2.3 TASC – Steps – Alternative / Exception Sequences

*Describe any alternative or exception sequences that may be required that deviate from the normal course of activities. Note instructions are found in previous table.*

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments

## 2.2.4 TASC – Post-conditions and Significant Results

*Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.*

*Describe any significant results from the Function*

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>

## 2.2.5 TASC – Architectural Issues in Interactions

*Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number..*

## 2.2.6 TASC – Current Implementation Status

*Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above*

*Identify the key existing products, standards and technologies*

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

### ***Current Implementations:***

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new
Future, no systems, no interactions	

<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	

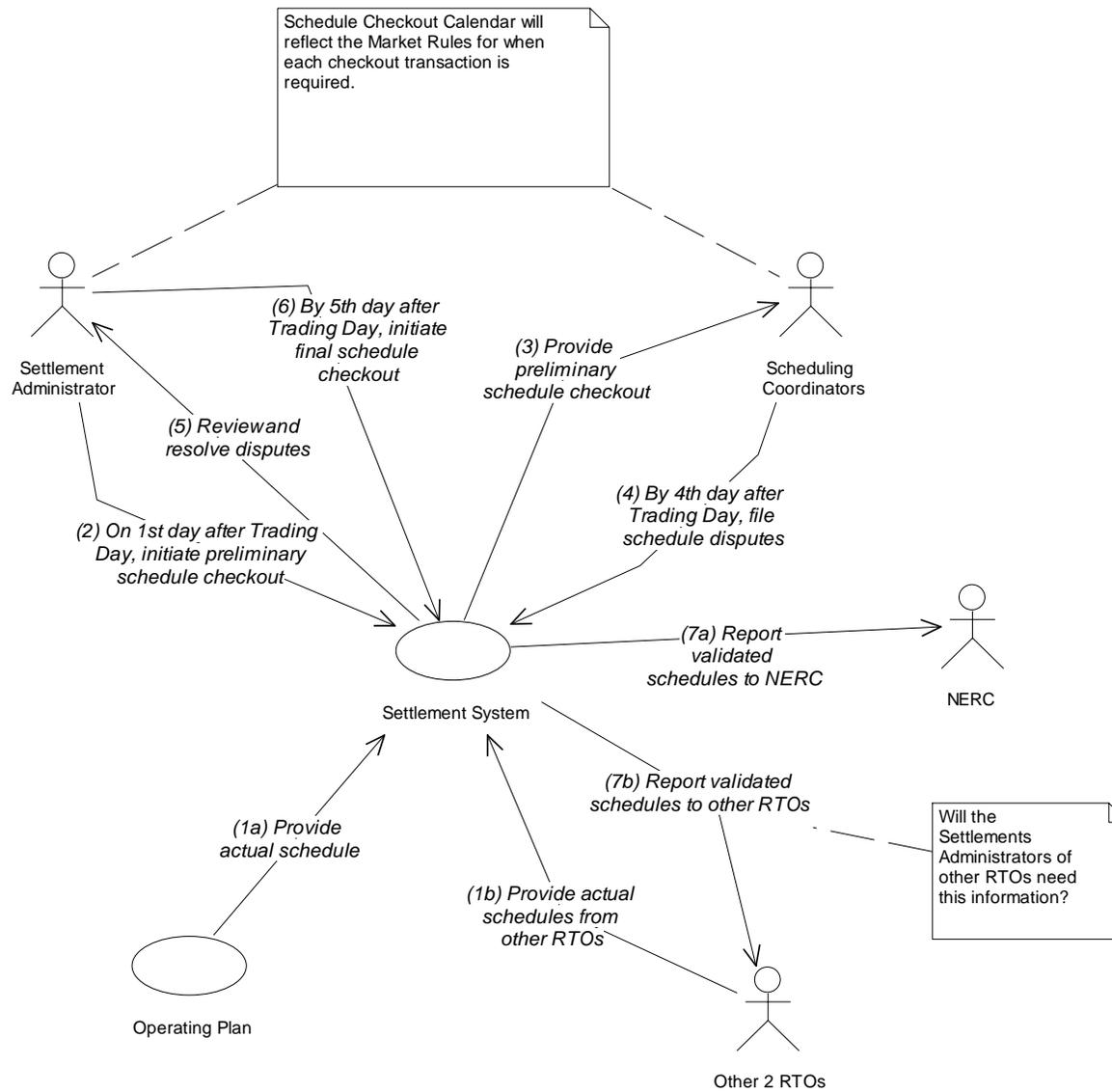
Validation of capabilities of function
--

Cost vs. benefit
------------------

### **2.2.7 TASC – Diagram**

*For clarification, draw (by hand, by Power Point, by UML diagram) the interactions, identifying the Steps where possible.*

Transmission and Ancillary Services Schedule Checkout Processes



## 2.3 Market Operations Financial Settlements (MOFS)

### 2.3.1 MOFS – Preconditions and Assumptions

*Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities*

*Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place*

*Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.*

<i>Actor/System/Information/Contract</i>	<i>Preconditions or Assumptions</i>

### 2.3.2 MOFS – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
(1a)	Cycle for handling market operations settlements	RTO Meter Data Management System	Provide metering data	Provide metering data	RTO Meter Data Management System	Settlement System	Metering data		RTOs / Market Participants
(1b)		RTO Meter Data Management System	Provide relevant metering data	Provide relevant metering data	RTO Meter Data Management System	Transmission Owner	Metering data		RTOs / Market Participants
(2)		Settlement Administrator	On day 46 after Trading Day, initiate preliminary settlement	On day 46 after Trading Day, initiate preliminary settlement	Settlement Administrator	Settlement System	Preliminary settlement information		User Interface
(3)		Settlement System	Provide preliminary settlement	Provide preliminary settlement	Settlement System	Scheduling Coordinators	Preliminary settlement information		User Interface
(4)		Scheduling Coordinators	By day 52, file settlement disputes	By day 52, file settlement disputes	Scheduling Coordinators	Settlement System	Any disputed settlements		User Interface

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
(5)		Settlement System	Review and resolve disputes	Review and resolve disputes	Settlement System	Settlement Administrator	Disputed information		User Interface
(6)		Settlement Administrator	By day 58, issue final settlement	By day 58, issue final settlement	Settlement Administrator	Settlement System	Final settlement information		User Interface
(7)		Settlement System	Provide final settlement	Provide final settlement	Settlement System	Scheduling Coordinators	Final settlement information		User Interface

### 2.3.3 MOFS – Steps – Alternative / Exception Sequences

*Describe any alternative or exception sequences that may be required that deviate from the normal course of activities. Note instructions are found in previous table.*

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments

### 2.3.4 MOFS – Post-conditions and Significant Results

*Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.*

*Describe any significant results from the Function*

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>

### 2.3.5 MOFS – Architectural Issues in Interactions

*Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number..*

### 2.3.6 MOFS – Current Implementation Status

*Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above  
Identify the key existing products, standards and technologies*

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

#### *Current Implementations:*

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Future, no systems, no interactions	

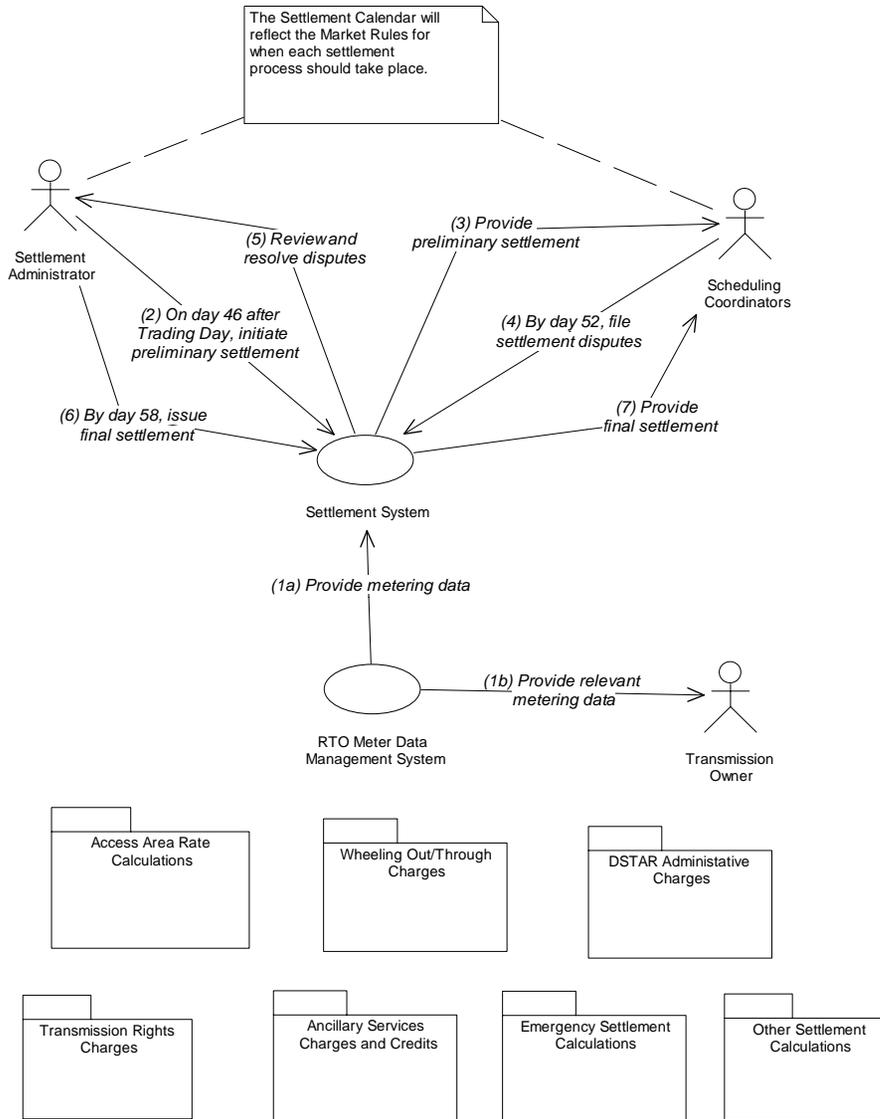
<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

### **2.3.7 MOFS – Diagram**

*For clarification, draw (by hand, by Power Point, by UML diagram) the interactions, identifying the Steps where possible.*

Transmission and Ancillary Services Settlement Process



## 2.4 Market Operations Accounting and Billing (MOAB)

### 2.4.1 MOAB – Preconditions and Assumptions

*Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities*

*Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place*

*Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.*

<i>Actor/System/Information/Contract</i>	<i>Preconditions or Assumptions</i>

## 2.4.2 MOAB – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
(1a)	Cycle for Accounting and Billing	Settlement System	Provide settlement information	Provide settlement information	Settlement System	Billing System	Settlement data		RTOs / Market Participants
(1b)		RTO Meter Data Management System	Provide transmission metering data	Provide transmission metering data	RTO Meter Data Management System	Billing System	Metering data		RTOs / Market Participants
(2)		Settlement Administrator	Issue invoice	By day 91, issue invoice	Settlement Administrator	Billing System	Invoice		User Interface
(3)		Scheduling Coordinators	Pay invoices	By day 96, pay invoices	Scheduling Coordinators	Billing System	Payment		User Interface
(4)		Billing System	Pay Transmission Owners	By day 97, pay Transmission Owners based on metering data	Billing System	Transmission Owner	Payment		User Interface

### 2.4.3 MOAB – Steps – Alternative / Exception Sequences

Describe any alternative or exception sequences that may be required that deviate from the normal course of activities. Note instructions are found in previous table.

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments

### 2.4.4 MOAB – Post-conditions and Significant Results

Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.

Describe any significant results from the Function

Actor/Activity	Post-conditions Description and Results

### 2.4.5 MOAB – Architectural Issues in Interactions

Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number..

## 2.4.6 MOAB – Current Implementation Status

*Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above  
Identify the key existing products, standards and technologies*

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

### *Current Implementations:*

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new
Future, no systems, no interactions	

<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	

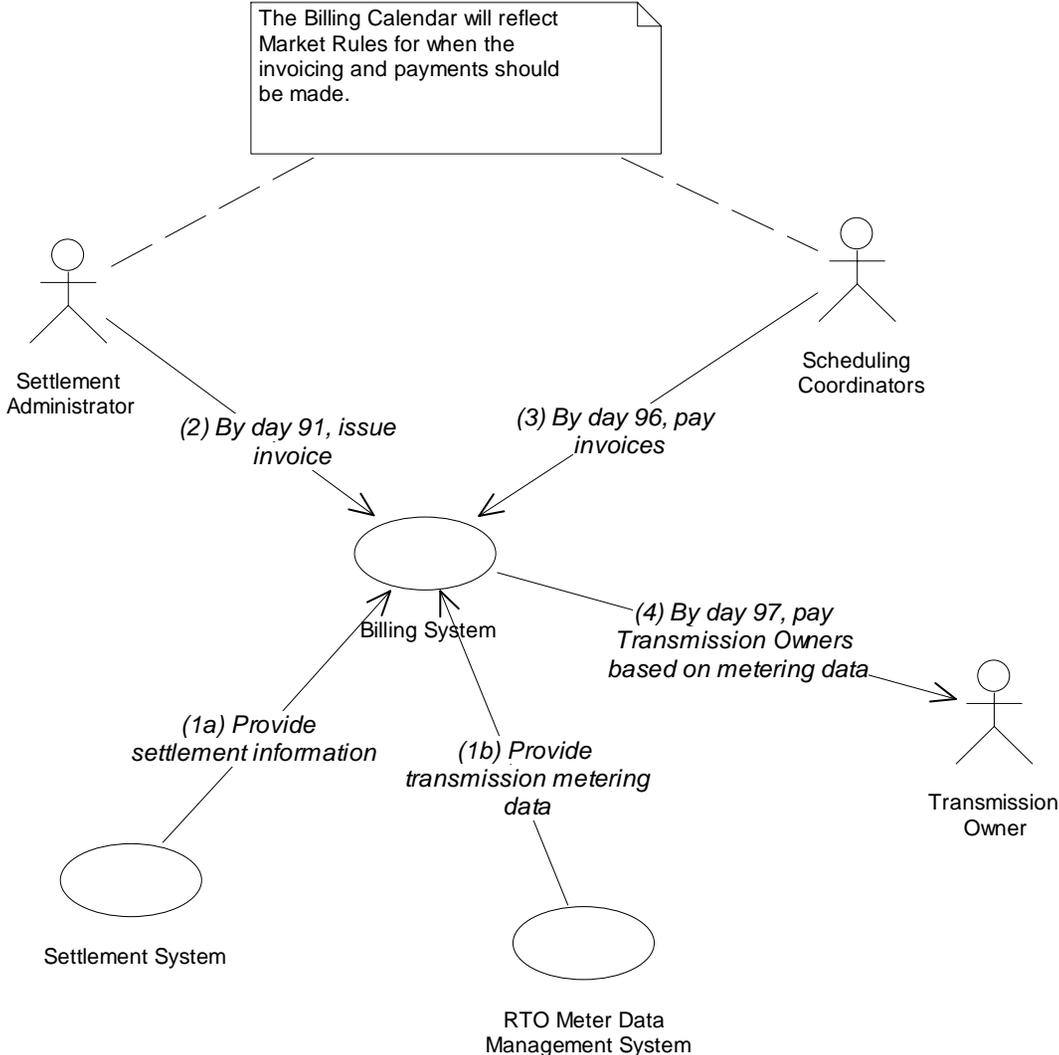
No changes will be needed

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

#### **2.4.7 MOAB – Diagram**

*For clarification, draw (by hand, by Power Point, by UML diagram) the interactions, identifying the Steps where possible.*

Accounting and Billing Processes



## 2.5 Market Monitoring and Auditing (MMA)

### 2.5.1 MMA – Preconditions and Assumptions

*Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities*

*Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place*

*Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.*

<i>Actor/System/Information/Contract</i>	<i>Preconditions or Assumptions</i>

### 2.5.2 MMA – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
1a	Periodically or Spot Check	Auditor	Review archival information	Review archival information	Auditor	Archives	Market operations information		Inter-Corporation
1b		Auditor	Review logs	Review logs	Auditor	Logs	Market operations information		Inter-Corporation

### 2.5.3 MMA – Steps – Alternative / Exception Sequences

*Describe any alternative or exception sequences that may be required that deviate from the normal course of activities. Note instructions are found in previous table.*

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments

### 2.5.4 MMA – Post-conditions and Significant Results

*Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.*

Describe any significant results from the Function

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>

### 2.5.5 MMA – Architectural Issues in Interactions

Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number..

### 2.5.6 MMA – Current Implementation Status

Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above  
Identify the key existing products, standards and technologies

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

#### *Current Implementations:*

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Future, no systems, no interactions	

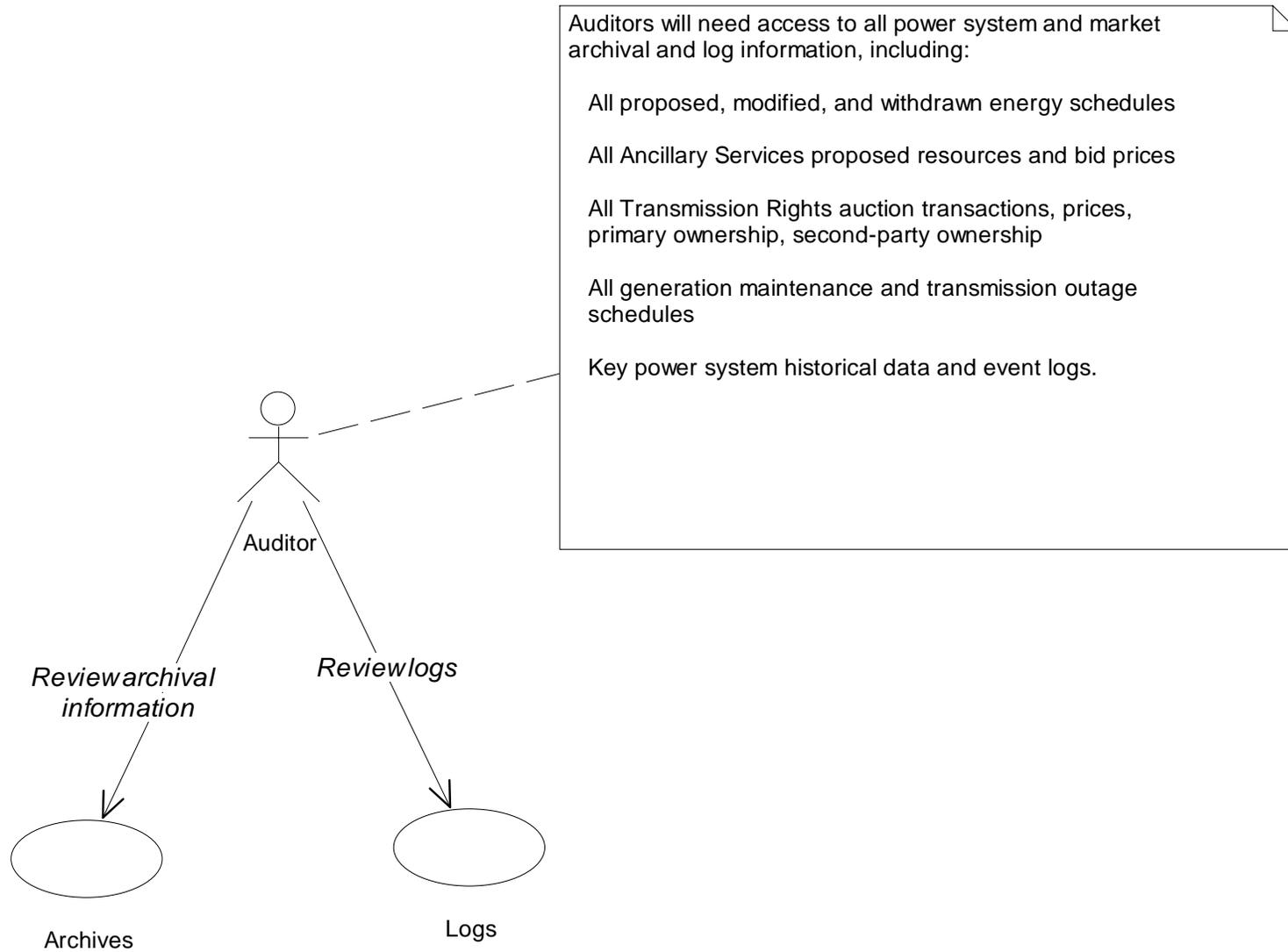
<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

### **2.5.7 MMA – Diagram**

*For clarification, draw (by hand, by Power Point, by UML diagram) the interactions, identifying the Steps where possible.*

## Market Monitoring and Auditing Processes



## 3 Auxiliary Issues

### 3.1 References and contacts

*Documents and individuals or organizations used as background to the function described; other functions referenced by this function, or acting as “sub” functions; or other documentation that clarifies the requirements or activities described. All prior work (intellectual property of the company or individual) or proprietary (non-publicly available) work must be so noted.*

ID	Title or contact	Reference or contact information
[1]		
[2]		

### 3.2 Action Item List

*As the function is developed, identify issues that still need clarification, resolution, or other notice taken of them. This can act as an Action Item list.*

ID	Description	Status
[1]		
[2]		

### 3.3 Revision History

*For reference and tracking purposes, indicate who worked on describing this function, and what aspect they undertook.*

No	Date	Author	Description
0.	Feb 27, 2004	Frances Cleveland	

No	Date	Author	Description